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(1.08.09.13)

U.S. DEPARTMENT OF ENERGY
OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY
NEPA DETERMINATION

RECIPIENT: University of Central Florida **STATE:** FL

PROJECT TITLE: Enabling Efficiencies >22.5% with Metal Oxide Passivated Contacts Using Low-Cost In-Line Atmospheric Pressure Chemical Vapor Deposition

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001387	DE-EE0007533	GFO-0007533-001	

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:

Description:

A9 Information gathering, analysis, and dissemination	Information gathering (including, but not limited to, literature surveys, inventories, site visits, and audits), data analysis (including, but not limited to, computer modeling), document preparation (including, but not limited to, conceptual design, feasibility studies, and analytical energy supply and demand studies), and information dissemination (including, but not limited to, document publication and distribution, and classroom training and informational programs), but not including site characterization or environmental monitoring. (See also B3.1 of appendix B to this subpart.)
B3.6 Small-scale research and development, laboratory operations, and pilot projects	Siting, construction, modification, operation, and decommissioning of facilities for smallscale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to the University of Central Florida (UCF) to increase photovoltaic (PV) module efficiency and reduce associated manufacturing costs by driving demonstrated lab-scale passivated contact technology into high-volume manufacturing of full 156x156 mm2 crystalline silicon (c-Si) cells.

Proposed activities would include the design, development, fabrication, and characterization of crystalline silicon wafers and PV cells coated with thin metal oxide films. Film depositions would occur at UCF's International Consortium for Advanced Manufacturing Research (ICAMR) facility in Kissimmee, Florida and at Fraunhofer ISE's research and development (R&D) facility in Freiburg, Germany. Test structures and PV cells would be fabricated based on these films in UCF's Nanophotonics Fabrication Facility (NPFF) in Orlando, Florida, at Fraunhofer ISE in Freiburg, Germany and at Suniva's R&D facility in Norcross, Georgia. Characterization of the films and devices would be completed at UCF's Advanced Materials Processing and Analysis Center (AMPAC) in Orlando, Florida; UCF's College of Optics & Photonics in Orlando, Florida; UCF's Florida Solar Energy Center (FSEC) in Orlando, Florida; and at Fraunhofer ISE in Freiburg, Germany. The facilities in which lab work would occur are purpose-built for the types of activities being proposed; therefore, no adverse impacts to sensitive resources are expected as a result of the proposed project. No change in the use, mission or operation of existing facilities would arise out of this effort. The facilities have all applicable permits in place, and would not need additional permits for the proposed activities.

The proposed project would necessitate the use and handling of hazardous substances such as metal organic CVD (MOCVD) precursors; Oxygen (O2) and Nitrogen (N2); Silane (SiH4); Phosphorus oxychloride (POCl3); Ammonia (NH3); Hydrofluoric acid(HF); Hydrochloric acid (HCl); Potassium hydroxide (KOH); and Isopropyl alcohol (IPA). Existing health and safety policies and procedures would be followed at each facility including employee training, proper protective equipment, engineering controls, monitoring, and internal assessments. All hazardous waste would be disposed of according to local, state, and federal guidelines.

Based on review of the project information and the above analysis, DOE has determined the proposed project would not have a significant individual or cumulative impact to human health and/or environment. DOE has determined that this project is consistent with actions outlined in DOE categorical exclusions A9 "Information gathering, analysis, and dissemination" and B3.6 "Small-scale research and development, laboratory operations, and pilot projects" and is therefore categorically excluded from further NEPA review. Further, the DOE has determined that work completed at

Fraunhofer ISE in Freiburg, Germany is exempt from review under Executive Order (EO) 12114, Section 5.1.1 "Environmental Effects Abroad of Major Federal Actions" of the DOE EO 12114 Implementing Guidelines.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

If the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Note to Specialist :

Solar Energy Technology Office
This NEPA determination does not require a tailored NEPA provision.
Review completed by Rebecca McCord 06/21/2016

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 6/23/2016

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

☐ Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:

☐ Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
☐ Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____

Field Office Manager